

Case Study

Enhancing Operational Efficiency & Optimizing Power Quality in the Plastic Packaging Industry



The plastic packaging industry in the United States is a significant sector that plays a crucial role in packaging various consumer goods and industrial products.

The Customer Situation

A plant of one of the key players in the plastic industry, located in Western US, faced multiple power quality challenges. Ongoing sensitive equipment failure, resulting in reduced productivity and increased energy consumption led to monthly Power Factor Penalty imposed by the utility company. Resolving this issue was crucial not only to improve operational efficiency but also to avoid financial penalties.

To accurately identify the root cause of these power quality issues, Elspec conducted in-depth investigation using the G4500 [portable power quality analyzer](#). The results showed lower-than-optimal voltage levels and poor power factor. Voltage fluctuations had detrimental effects on the performance and lifespan of critical equipment. The unstable voltage levels led to equipment failures, frequent breakdowns, and increased maintenance costs. The poor power factor, affected the efficient operation of electrical equipment and led to the penalties imposed by the utility company.

The Solution: Installing Elspec's Activar Plus Power Quality System

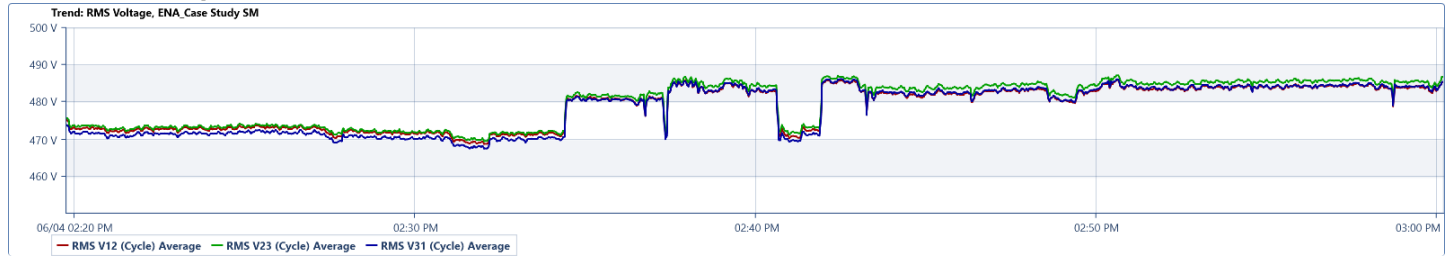
The solution chosen for this customer was a 1140kVAR [semi-dynamic reactive compensation system](#), Activar+ by Elspec. The Activar+ is a static VAR compensation system with transient free solid state switching power factor correction. It is highly efficient, it compensates lagging power factor, filter harmonics and helps to enhance machinery operation life time. The Activar+ offers many features in one simple solution and has a high safety level thanks to its zero-crossing switching technology.



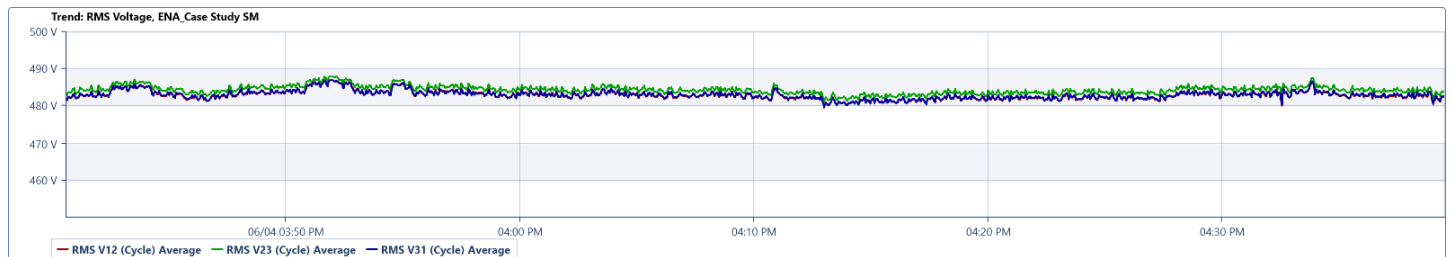
The Results

Voltage levels: The voltage was stabilized around 480V.

Without the Equalizer

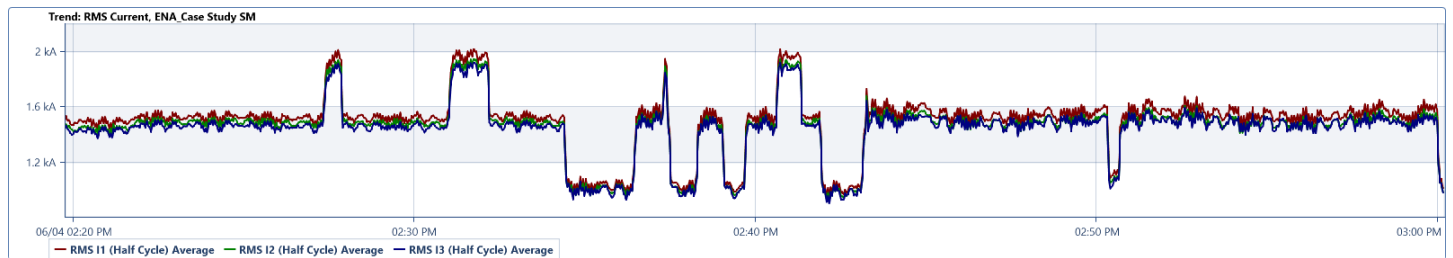


With the Equalizer

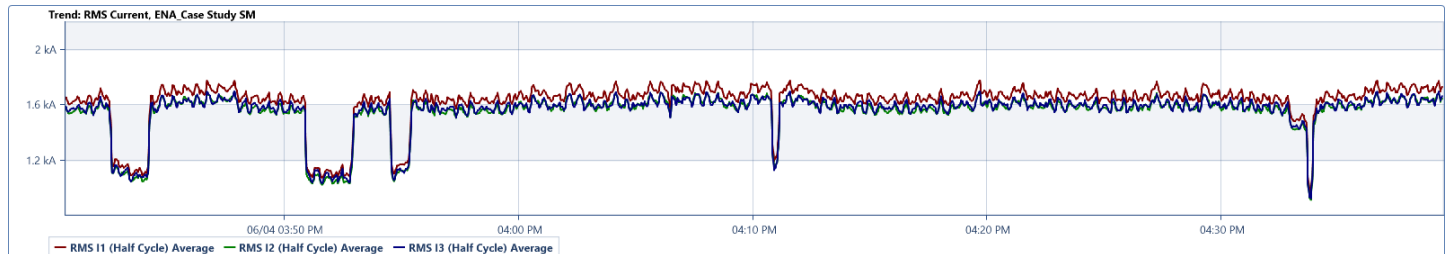


Current: The current waveform became much cleaner and stable with the Activa+ system, allowing the machines to work optimally.

Without the Equalizer

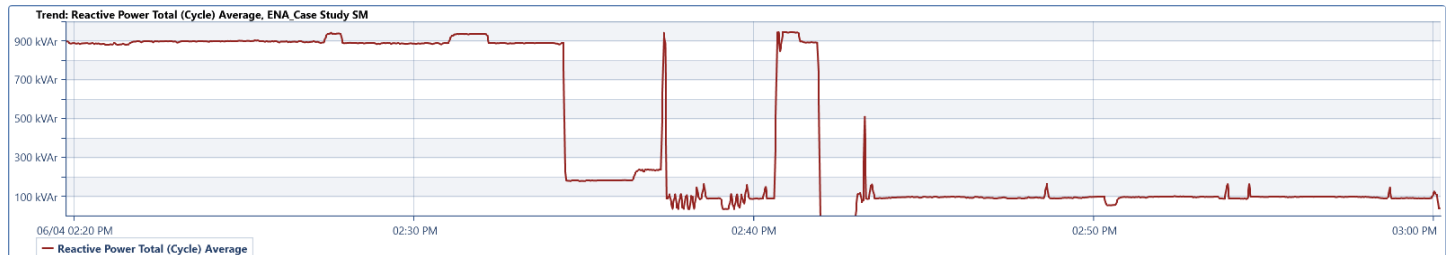


With the Equalizer

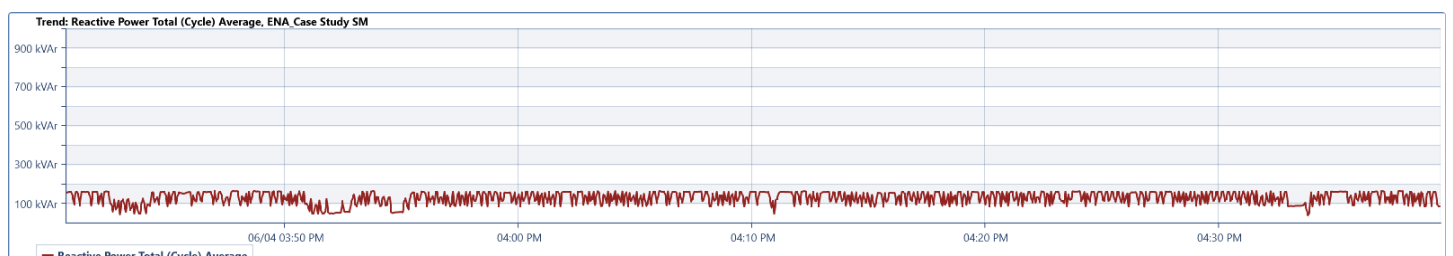


Reactive Power: A significant reduction in reactive power. From an unstable reactive power, reaching peak demand of 900kVAR to a stable demand of around 150kVAR.

Without the Equalizer

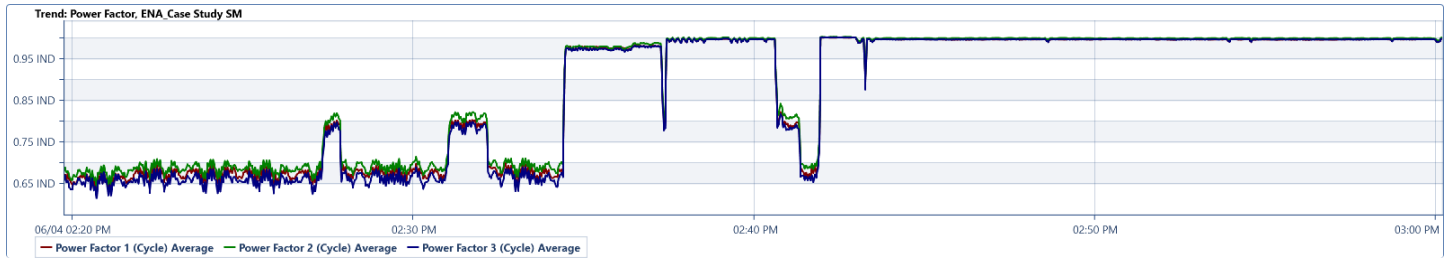


With the Equalizer

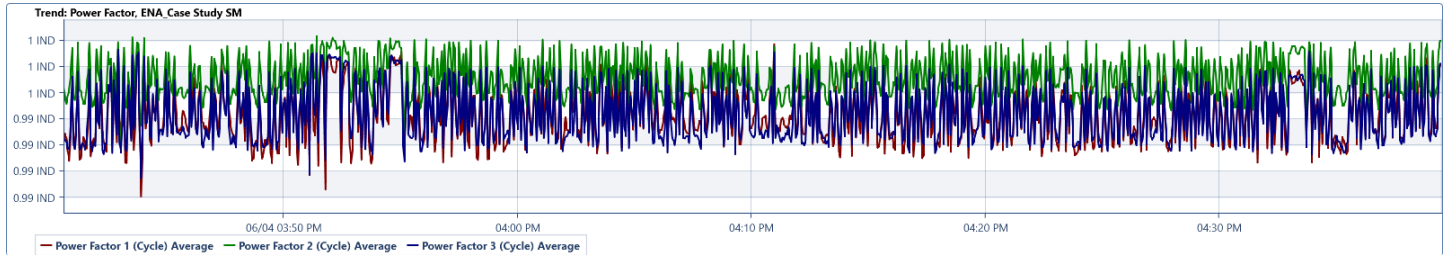


Power Factor: The Power Factor improved from an average of 0.85IND to 0.99IND, placing the power factor values above the average value required by the national regulations.

Without the Equalizer



With the Equalizer



Conclusions

Installing Elspec's Activar+ PQ system has resulted in the following benefits:

- Reduced voltage fluctuations, ensuring a more stable power supply.
- Stabilized voltage to approximately 480V, optimizing the operating voltage for equipment.
- Reduced reactive power, efficiently managing the energy use.
- Improved Power Factor, enhancing overall energy efficiency and reducing power losses.

The installation of Elspec's Activar+ PQ system has provided substantial benefits, ensuring reliable power supply, increasing equipment longevity, and minimizing potential financial risk.



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